

SECTION 6

ALTERNATIVE CONCEPTS

INTRODUCTION

This section describes alternative concepts for providing the facilities for accommodating future aviation demand at Cochise College Airport. Alternative concepts showing locations and layouts for needed facilities were evaluated and a preferred development concept was prepared. The preferred development concept allows the Airport to serve all aviation demand forecasted for the next 20 years, with flexibility to expand facilities further to accommodate aviation growth beyond the forecast period.

The goal of the concept alternatives analysis was to identify the option that best satisfies the following development criteria:

- Aviation Program Requirements. Conceptual plans must satisfy the facility requirements identified in Section 5 to meet the future needs of the College's aviation program for the next 20 years. Additionally, space must be reserved for aviation needs beyond the year 2020 and as a contingency against underestimating requirements.
- Safety of Aircraft Operations. The future development must continue to meet FAA planning and design criteria to enhance the safety of air operations.
- Compatibility with Cochise College Development. The airport plans must be compatible with other planned facility improvements on the Douglas campus.
- Community and Environmental Compatibility. Future development of the airport and the surrounding community and natural environment must be compatible.
- Operational Efficiency. The future development at the airport should enhance the operational efficiency of the aviation program, particularly flight training.
- Flexibility. The plans for future airport development must be flexible enough to accommodate changing needs that cannot be anticipated now. Airport expansion capabilities should be preserved.
- Capital Cost. Airport improvements must be cost-effective and be matched with the ability of the College to fund the improvements.

Alternative improvement concepts were prepared with the objective of satisfying these criteria.

ALTERNATIVE DEVELOPMENT CONCEPTS

Six alternative airport improvement concepts were prepared. The concepts differ primarily in the extent to which future airport development would accommodate (a) a straight-in instrument approach procedure or (b) larger training aircraft. In Concepts A and B, future development would follow the FAA planning standards for the single and twin-engine piston aircraft currently in the training fleet (ARC B-I), and the proposed GPS instrument approach procedure would be a circling approach. Concepts C and D assume that the proposed GPS procedure would be a straight-in instrument approach procedure, which would require the building restriction line to be relocated farther from the runway and could potentially require the relocation of some existing buildings.

Concepts E and F are based on FAA standards for turboprop aircraft (ARC B-II), in the event that flight training in such aircraft would become a regular part of the training curriculum at Cochise College Airport. To satisfy the FAA standards for these concepts, the parallel taxiway would have to be relocated farther from the runway and some existing buildings would need to be relocated.

The concepts are illustrated in Figures 6-1 through 6-6 and described below.

Concept A: Minimum Development With ARC B-I Standards

Concept A (Figure 6-1) represents the minimum airport development needed to satisfy the 20-year facility requirements identified in Section 5 and maintain taxi-through aircraft parking on the apron. This concept assumes that turboprop activity will not be a significant element of flight training at the airport and therefore the ARC B-I standards would apply. In this concept, the Building Restriction Line (BRL) would not have to be relocated, and therefore there would be no need to relocate any existing buildings.

The chief development features of Concept A to 2020 are:

- Acquiring a property interest in the Runway Protection Zones (RPZs) of Runways 5 and 23, either through fee title acquisition or avigation easement.
- Widening the parallel taxiway to 25 feet, maintaining the existing centerline location.
- Establishing a separation of 69 feet between the parallel taxiway centerline and the apron taxilane centerline; and establishing a separation of 39.5 feet from the apron taxilane centerline and aircraft parking area.
- Adding approximately 3,150 square yards of apron to provide a total of 32 tiedown spaces. Spaces would be added on the existing apron at the south end to minimize new apron construction. The taxilane along the south side of the apron would be eliminated by the addition of these new tiedown positions.
- Maintaining the building restriction line 250 feet from the runway centerline.

- Adding a new shade building to accommodate ten aircraft.
- Expanding the Technology Center building and adjacent parking area if other uses of the building don't reduce their needs for space at the Technology Center.
- Constructing a new aircraft maintenance hangar for maintenance of the flight school aircraft fleet.
- Installing runway end identifier lights.
- Providing a global positioning system (GPS) circling instrument approach procedure.
- Upgrading the runway and taxiway lights to medium intensity lighting.
- Installing an Automated Weather Observing System.
- Installing a pilot-control system for airfield lighting, and a ground communications outlet.

Concept B: Maximization of Apron Taxi Capability With ARC B-I Standards

Concept B (Figure 6-2) is similar to Concept A, but provides increased taxiing capability on the tiedown apron and locates the aircraft maintenance hangar farther to the west. This concept, similarly to Concept A, assumes that turboprop activity will not be a significant element of flight training at the airport and therefore the ARC B-I standards would apply. As with Alternative A, the BRL would not have to be relocated, and therefore there would be no need to relocate any existing buildings.

The chief development features of Concept B are the same as Concept A except for the following:

- The existing taxilane along the south end of the apron would be retained to provide greater maneuverability of aircraft on the apron.
- No tiedowns would be "nested."
- Approximately 6,130 square yards of apron, compared with 3,150 in Concept A, would be added to provide the 32 tiedown spaces.

Concept C: Development With ARC B-I Standards, Providing a Straight-in Instrument Approach Capability

Concept C (Figure 6-3) is similar to Concept A, but locates future shade facilities behind a 370-foot BRL to provide for a future straight-in instrument approach capability. It is possible that the existing buildings that penetrate this BRL would not affect the straight-in instrument approach capability and would be able to remain. Costs for this concept are based on the assumption that the buildings would not need to be relocated. This concept, similarly to Concept A, assumes that turboprop activity will not be a significant element of flight training at the airport and therefore the ARC B-I standards would apply.

Concept D: Development With ARC B-I Standards, Providing a Straight-in Instrument Approach Capability, while not Significantly Encroaching Into the Technology Center Parking Lot

Concept D (Figure 6-4) is similar to Concept C, but places the new shade spaces in two buildings and locates the aircraft maintenance hangar adjacent to the middle shade building.

Concept E: Minimum Development With ARC B-II Standards

Concept E (Figure 6-5) represents the minimum airport development needed to satisfy the 20- year facility requirements identified in Section 5, while meeting the ARC B-II standards for turboprop activity, and maintaining taxi-through aircraft parking on most of the apron.

The chief development features of Concept C are:

- Widening the runway to 75 feet.
- Widening the parallel taxiway to 35 feet, and relocating the centerline to 227.3 feet from the runway.
- Establishing a separation of 75.4 feet between the parallel taxiway centerline and the apron taxilane centerline; and establishing a separation of 42.8 feet from the apron taxilane centerline and aircraft parking area.
- Adding approximately 9,520 square yards of apron to provide a total of 33 tiedown spaces. Spaces would be added on the existing apron at the south end and some spaces would be nested to minimize new apron construction. The taxilane along the south side of the apron would be eliminated by the addition of these new tiedown positions.
- Establishing a Building Restriction Line 370 feet from the runway centerline.
- Removing a portion of the north end of the shade building to comply with separation standards.
- Adding two new shade buildings to accommodate 12 aircraft.

- Removing or relocating a storage building and two trailer buildings.
- Expanding the Technology Center building and adjacent parking area if other uses of the building don't reduce their needs for space at the Technology Center.
- Constructing a new aircraft maintenance hangar for maintenance of the flight school aircraft fleet.
- Installing runway end identifier lights.
- Providing a global positioning system (GPS) straight-in instrument approach procedure.
- Upgrading the runway and taxiway lights to medium intensity lighting.
- Installing an Automated Weather Observing System.
- Installing a pilot-control system for airfield lighting, and a ground communications outlet.
- Installing a new 5,000-gallon storage tank for Jet-A fuel.
- Purchasing a fire truck to comply with FAA standards for larger aircraft. It is assumed an ARFF station would not be constructed.

Concept F: Apron Taxi-Through Capability With ARC B-II Standards

Concept F (Figure 6-6) is similar to Concept E but provides increased taxi-through capability on the tiedown apron. This concept, similarly to Concept E, assumes that turboprop activity will be a significant element of flight training at the airport and therefore the ARC B-II standards would apply.

The chief development features of Concept F are the same as Concept E except for the following:

- The new shade structure nearest the existing shade building would be larger and would encroach slightly on the parking lot, similarly to Concepts A and B.
- The aircraft maintenance hangar would be located farther west, adjacent to the tiedown area.
- Approximately 10,870 square yards of apron, compared with 9,520 in Concept E, would be added to provide a total of 33 tiedown spaces. Only two tiedown spaces would be nested.

EVALUATION OF ALTERNATIVES

The alternative concepts were evaluated according to the seven criteria described at the beginning of this section. A summary evaluation matrix is presented as Table 6-1.

Table 6-1
SUMMARY OF EVALUATION OF
ALTERNATIVE DEVELOPMENT CONCEPTS

Criterion	Concept A	Concept B	Concept C	Concept D	Concept E	Concept F
Cochise College Aviation Program Requirements	Satisfies all Aviation Program requirements	Satisfies all Aviation Program requirements	Satisfies all Aviation Program requirements	Satisfies all Aviation Program requirements	Satisfies all Aviation Program requirements	Satisfies all Aviation Program requirements
Safety of Aircraft Operations	Satisfies all FAA airport design requirements	Satisfies all FAA airport design requirements	Satisfies all FAA airport design requirements	Satisfies all FAA airport design requirements	Satisfies all FAA airport design requirements	Satisfies all FAA airport design requirements
Compatibility with Cochise College Development	Compatible with other Cochise College development	Compatible with other Cochise College development	Requires a significant amount of Technology Center parking lot	Compatible with other Cochise College development	Compatible with other Cochise College development	Compatible with other Cochise College development
Community and Environmental Compatibility	Compatible	Compatible	Compatible	Compatible	Compatible	Compatible
Operational Efficiency	Eliminates taxilane on south side of tiedown apron	Preserves taxilane on south side of tiedown apron and requires no nested spaces	Eliminates taxilane on south side of tiedown apron	Eliminates taxilane on south side of tiedown apron	Eliminates taxilane on south side of tiedown apron	Eliminates taxilane on south side of tiedown apron
Flexibility	Meets FAA standards for aircraft to 12,500 pounds and circling instrument approach	Meets FAA standards for aircraft to 12,500 pounds and circling instrument approach	Meets FAA standards for aircraft to 12,500 pounds and straight-in instrument approach	Meets FAA standards for aircraft to 12,500 pounds and straight-in instrument approach	Meets FAA standards for aircraft over 12,500 pounds and straight-in instrument approach	Meets FAA standards for aircraft over 12,500 pounds and straight-in instrument approach
20-Year Capital Costs (Millions of Dollars)	2.3	2.4	2.3	2.4	3.7	3.8

On August 17, 2000, a Planning Advisory Committee (PAC) meeting was held to review the Concepts A, B, E and F, which were the only concepts developed at that time. The following conclusions were reached:

- Due to the high costs associated with modifying the airport to accommodate turboprop aircraft such as the B-1900, this size aircraft, if acquired by the College, would be based at one of the nearby public airports that can accommodate aircraft of this size. Therefore, Concepts E and F were dropped from further consideration.
- The Concept A approach for expanding the tiedown apron is preferred over Concept B.
- Options to purchasing the property for the RPZs on the east and west ends of the airport will be explored, such as acquiring avigation easements or seeking donation of the properties.
- Options to relocating the irrigation well east of the airport. were discussed but it was later found that the well complies with all FAA criteria concerning the height of objects in the approach area.
- To comply with RSA and ROFA standards, the rodeo training area service road at the end of Runway 23 will continue to be used only on a controlled-basis, whereby the road is closed when Runway 5 is in use.

Subsequent to the August 17, 2000 PAC meeting, Concepts C and D were developed to explore the benefits and costs of providing a future straight-in GPS approach procedure for ARC B-I standards instead of the circling approach envisioned for Concepts A and B. A straight-in non-precision approach requires that the Federal Aviation Regulations (FAR) Part 77 Primary Surface (discussed further in Section 7) be widened from the present 250 feet to 500 feet. With this change, the 7:1 Transitional Surface would begin 250 feet from the runway centerline instead of the present 125 feet. The result of this would be that the end of the shade building (3 aircraft positions closest to the runway) and the 3 TRW buildings would penetrate the Part 77 Transitional Surface. Further, the Building Restriction Line (BRL) would need to be relocated to approximately 370 feet from the runway centerline to prevent new buildings, including the new shade building and maintenance, from penetrating the Transitional Surface.

Based on discussions with the FAA, it appears likely that the existing buildings might not impact a straight-in GPS approach procedure, and therefore could possibly remain with obstruction lighting added. However, the need to relocate any buildings cannot be determined until an approach procedure is fully analyzed.

Bisbee-Douglas Airport has a straight-in instrument approach procedure that can be used for flight training and periods of poor weather. Because of the availability of this approach procedure, the relative lack of poor weather, and the potential need to relocate buildings, it is concluded that master planning should proceed based on Concept A, but that phased development should occur in a way that does not preclude a future straight-in instrument approach procedure. This would be done by constructing the first phase of the shade building (five units) 370 feet from the runway centerline, within the footprint of the building shown in Concept A. When approach procedure studies are done, estimated to be in Phase 2, building relocation needs can be assessed and the type of approach procedure determined. The location of the remaining shade spaces would be determined based on whether the new approach procedure is circling or straight-in.

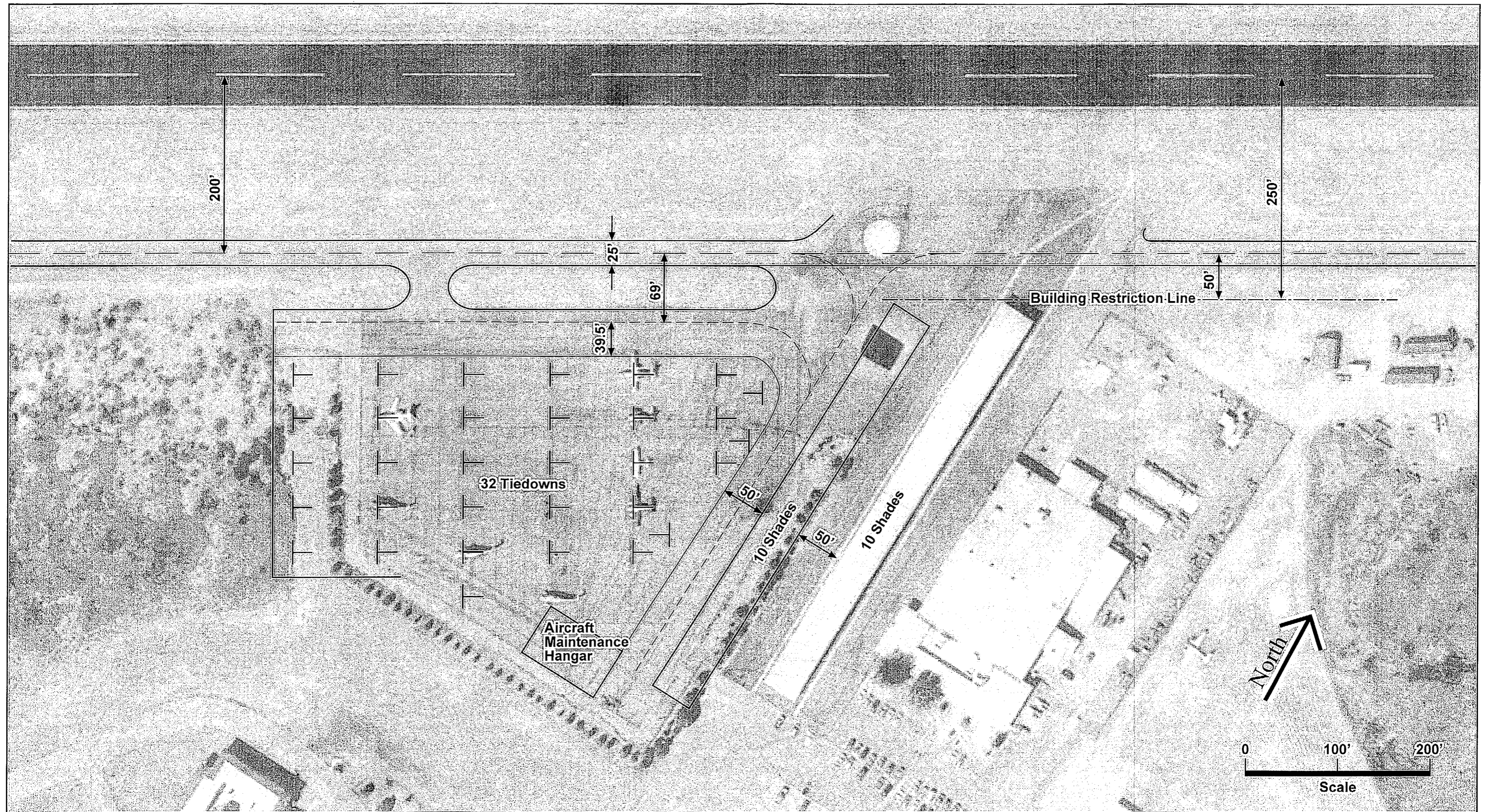


Figure 6-1
 Cochise College Airport
 Development Concept A
 (ARC B-I Standards with
 Circling GPS Approach)

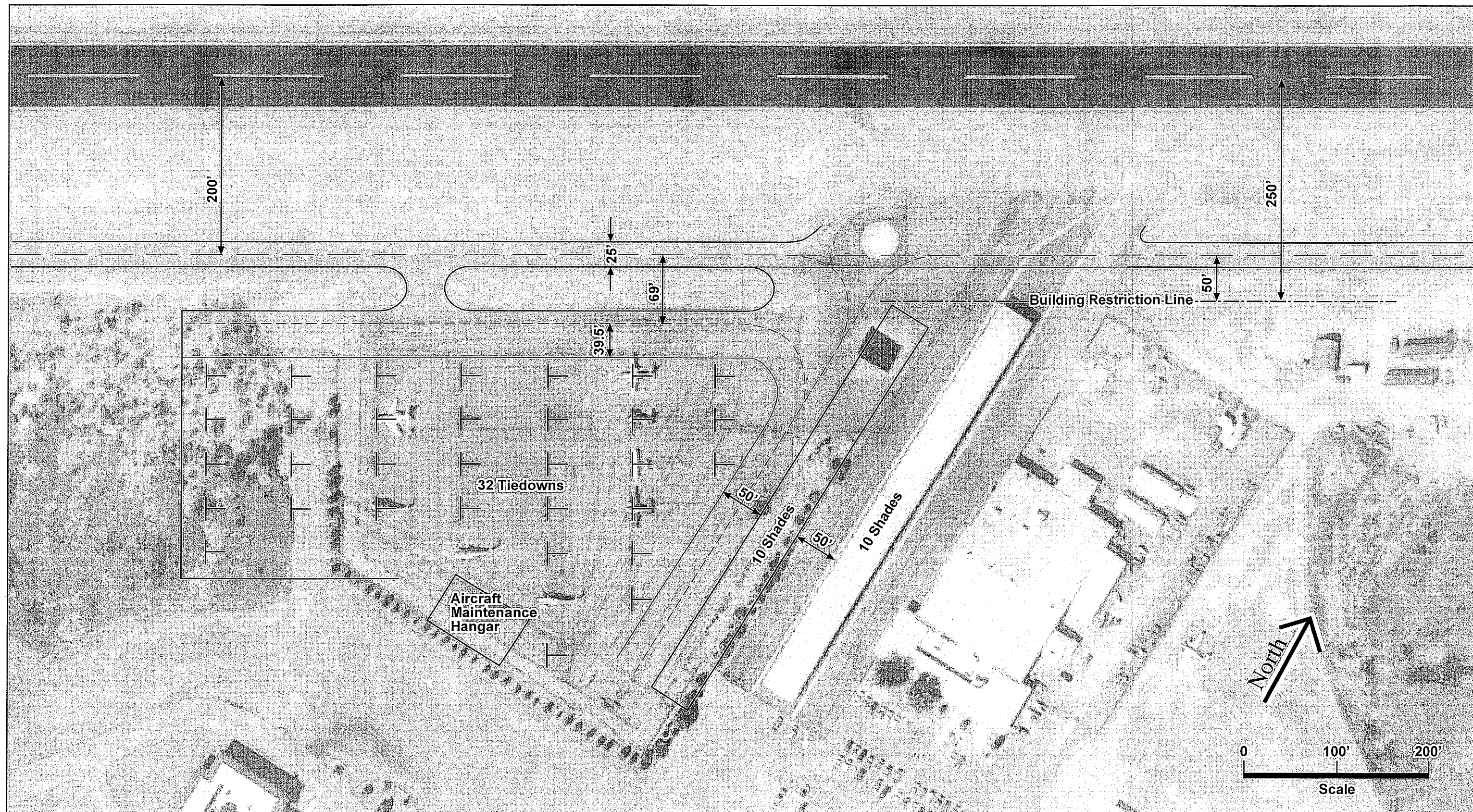


Figure 6-2
**Cochise College Airport
 Development Concept B
 (ARC B-I Standards with
 Circling GPS Approach)**

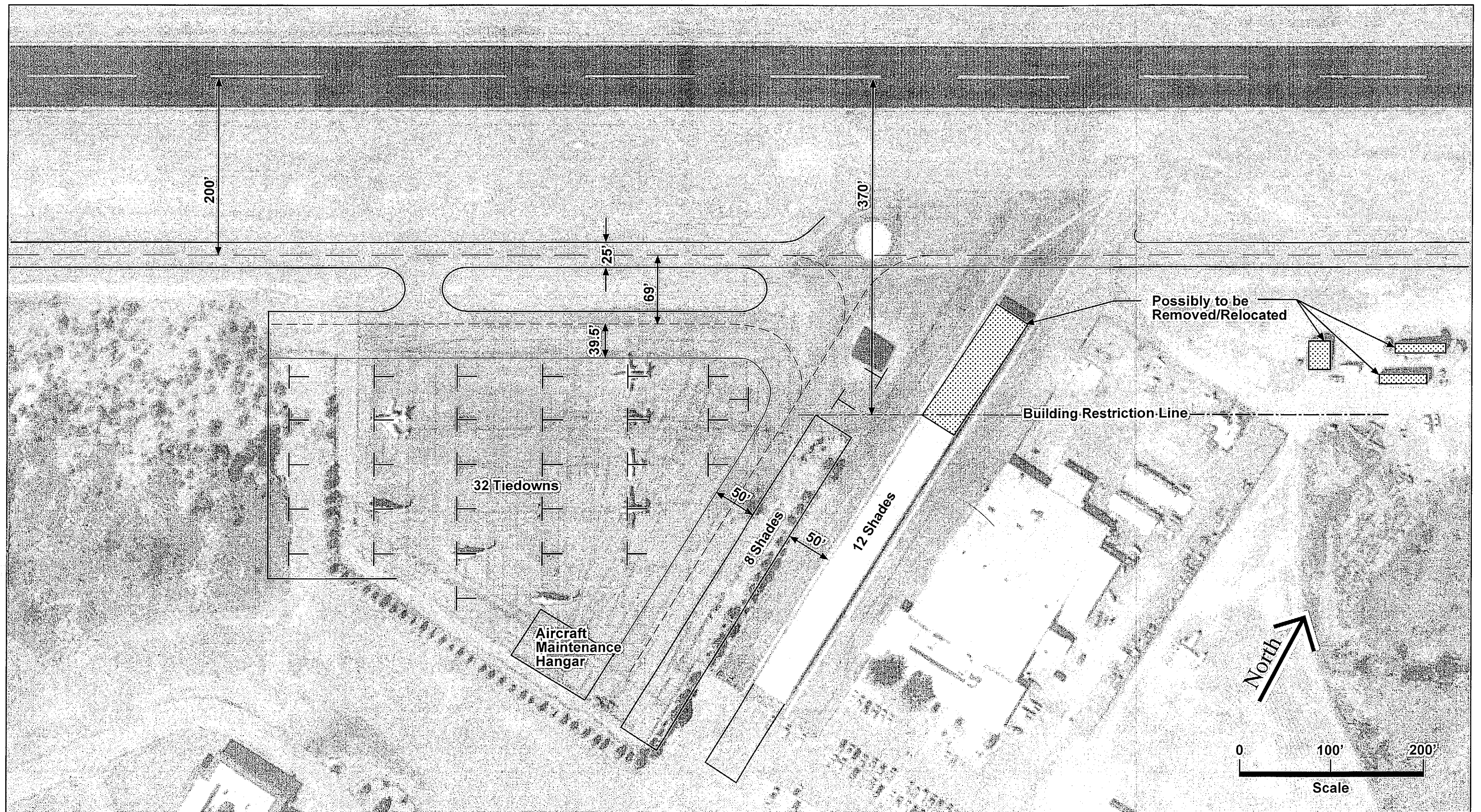


Figure 6-3
 Cochise College Airport
 Development Concept C
 (ARC B-I Standards with Straight-in
 Non-Precision GPS Approach)

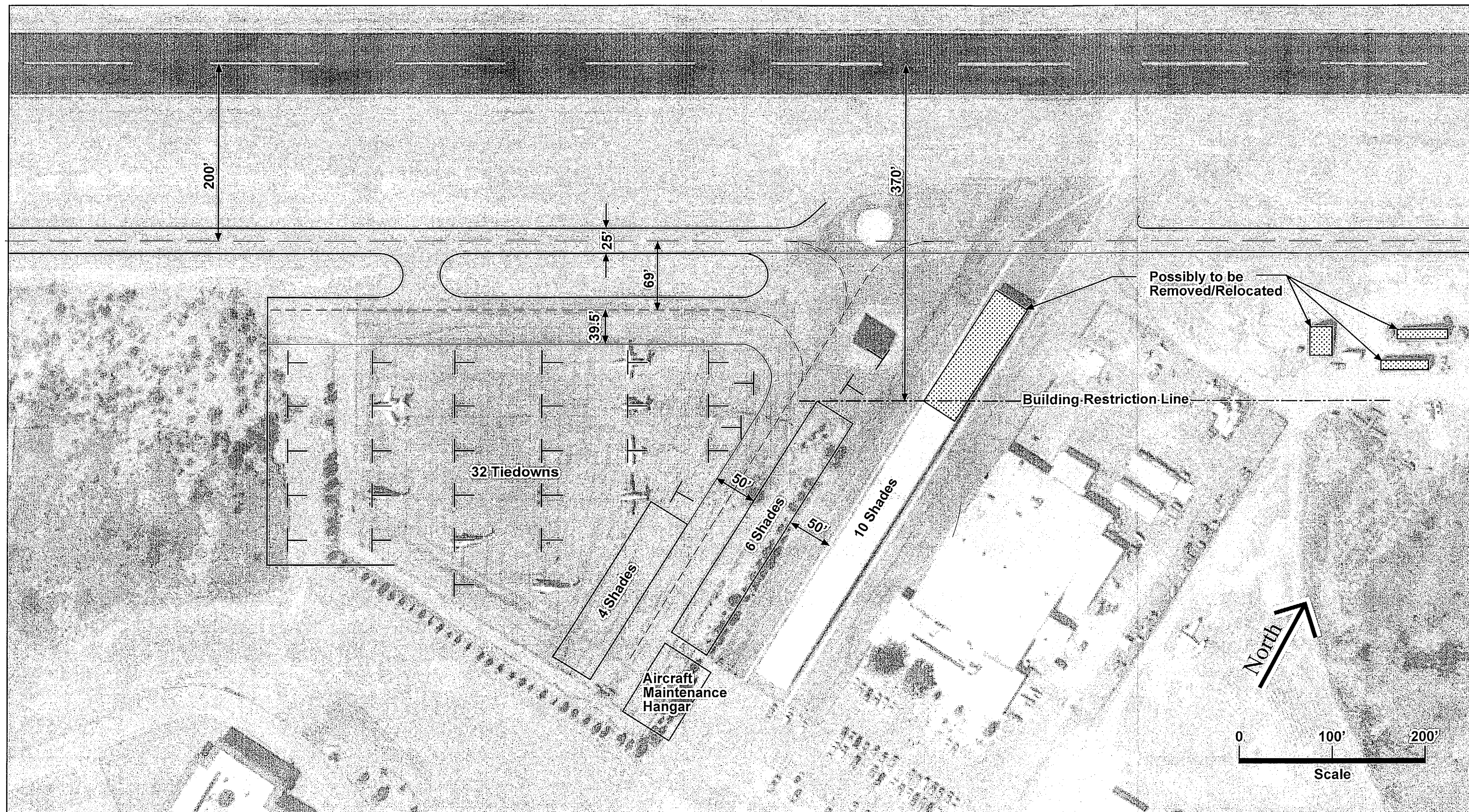


Figure 6-4
Cochise College Airport
Development Concept D
 (ARC B-I Standards with Straight-in
 Non-Precision GPS Approach)

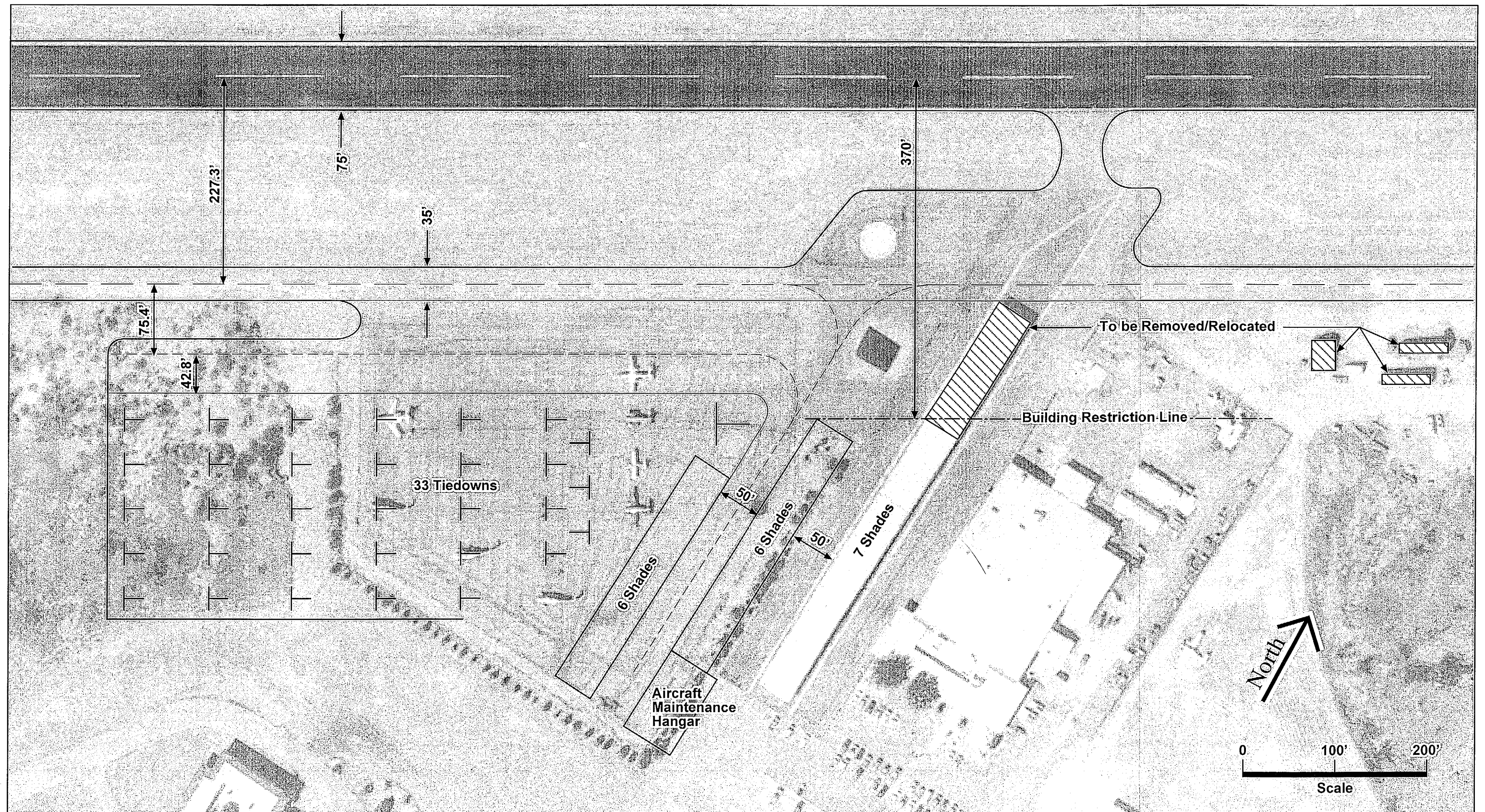


Figure 6-5
 Cochise College Airport
 Development Concept E
 (ARC B-II Standards with Straight-in
 Non-precision GPS Approach)

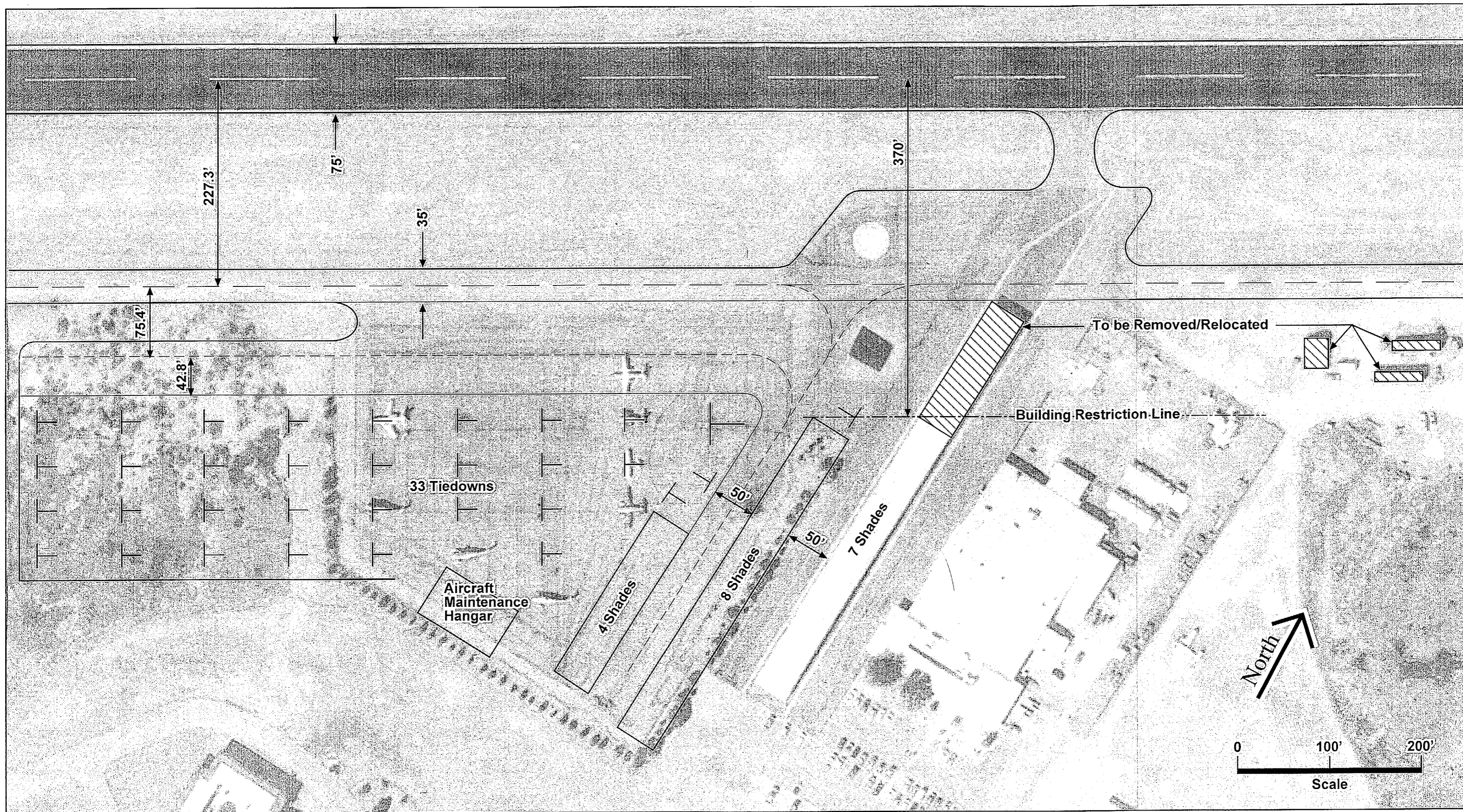


Figure 6-6
Cochise College Airport
Development Concept F
 (ARC B-II Standards with Straight-in
 Non-precision GPS Approach)